WHAT IS CLAIMED IS:

Sub A'

1. A mutant SPE-C toxin or fragment thereof, wherein the mutant has at least one amino acid change and is substantially nonlethal compared with a protein substantially corresponding to wild type SPE-C toxin.

2. A mutant SPE-C toxin according to claim 1, wherein the mutant SPE-C toxin comprises one to six amino acid substitutions; and

wherein at least one of the substituted amino acids is positioned in a β-barrel of a B-subunit, in an N-terminal alpha helix, in a diagonal alpha helix, or in a surface groove between subunit A and subunit B.

Sub A2

3. A mutant SPE-C toxin according to claim 1, wherein the mutant SPE-C toxin comprises one to six amino acid substitutions; and

wherein at least one of the substituted amino acids is aspartic acid-12, tyrosine-15, tyrosine-17, histidine-35, asparagine-38, lysine-135, lysine-138, tyrosine-139, or aspartic acid-142.

4. The mutant SPE-C toxin of claim 3, wherein the at least one amino acid substitution comprises the substitution of aspartic acid-12 to alanine, glutamic acid, asparagine, glutamine, lysine, arginine, serine, or threonine; the substitution of tyrosine-15 to phenylalanine, alanine, glycine, serine, or threonine; the substitution of tyrosine-17 to phenylalanine, alanine, glycine, glutamic acid, lysine, arginine, aspartic acid, serine, or threonine; the substitution of histidine-35 to phenylalanine, alanine, glycine, glutamic acid, lysine, arginine, aspartic acid, tyrosine, phenylalanine, serine, or threonine; the substitution of asparagine-38 to alanine, aspartic acid, glutamic acid, lysine or arginine; the substitution of lysine-135 to glutamic acid or aspartic acid; the substitution of lysine-138 to glutamic acid or aspartic acid; the substitution of tyrosine-139 to phenylalanine, alanine, glycine, glutamic acid, lysine, arginine, aspartic acid,

serine, or threonine; or the substitution of aspartic acid-142 to alanine, glutamic acid, asparagine, glutamine, serine, threonine, lysine or arginine.

5. The mutant SPE-C toxin of claim 4, wherein the at least one amino acid substitution comprises the substitution of aspartic acid-12 to alanine, the substitution of tyrosine-15 to alanine, the substitution of tyrosine-17 to alanine, the substitution of histidine-35 to alanine, the substitution of asparagine-38 to aspartic acid, the substitution of lysine-135 to aspartic acid; the substitution of lysine-138 to aspartic acid; the substitution of tyrosine-139 to alanine, or the substitution of aspartic acid-142 to asparagine.

6. The mutant SPE-C toxin of claim 3, wherein the at least one amino acid substitution comprises substitution of tyrosine-15 and asparagine-38.

7. The mutant SPE-C toxin of claim 6, wherein the substitutions are tyrosine-15 to alanine and asparagine-38 alanine.

8. The mutant SPE-C toxin of claim 3, wherein the at least one amino acid substitution comprises substitution of tyrosine-17 and asparagine-38.

9. The mutant SPE-C toxin of claim 8, wherein the substitutions are tyrosine-17 to alanine and asparagine-38 alanine.

10. The mutant SPE-C toxin of claim 1, wherein the mutant has at least one of the following characteristics: the mutant has a decrease in mitogenicity for T-cells, the mutant does not substantially enhance endotoxin shock, the mutant is not lethal, or the mutant is nonlethal but retains mitogenicity comparable to that of the wild type SPE-C toxin.

11. A vaccine for protecting animals against at least one biological activity of wild-type SPE-C comprising: an effective amount of at least one mutant SPE-C toxin according to claim 1.

12. A pharmaceutical composition comprising: a mutant SPE-C according to claim 1 in admixture with a physiologically acceptable carrier.

13. A DNA sequence encoding a mutant SPE-C toxin according to claim 1.

14. A stably transformed host cell comprising a DNA sequence according to claim 13.

15. A method for protecting an animal against at least one biological activity of a wild type SPE-C comprising: administering a vaccine according to claim 11 to an animal.

16. A method for reducing symptoms associated with toxic shock comprising: administering a vaccine according to claim 11 to an animal.

add A5

add C17

add B8